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MPGFYIEIVIKVPSDLDEHLPGISDSFVNVAEKEWELEPPSDMDLNLIEQAPLTVAEKLQRDFL
TEWRRVSKAPEALFFVQFEGESYFHMHVLFVETTGVKSMVLGRFLSQIREKLIQRIYRGEPTL
PNWFAVTKTRNGAGGGNKVUDCEYIPIPNLLPKTQPELQWAQWTNMEQYLSACLNTERKRLVAQH
LTHVSCTQEKENQNPNSDAPVIRSKTSARYMELVGWLVDKGITSEKQWIQEDQASYISFNAA
SNSRSQIKAALDAGKIMSLTKTAPDYLGVQQPVEDISSNRIYKILELNGYDPQYAASVFLGWA
TKKFGKRNTIWLFGPATTCGKTNIAEAIATHTPVYFGCNWNTNENFPNDCCVDMVIWEEGKMTA
KVVESSAKAILGGSKVRDQCKSSAQIDPTPVVTNTNCVIDGNSTTFEBHQQLPQLDRMFKF
ELTRRLDHDFGKVTQEVKDFFRWAKDHVVVEHEFYVKKGGAKKRPAAPSDADI SEP KRVRESV
AQPSTSDEAESINYADRYQNCKCSRHVGMNMLFPCRQCEMRNQNSNICFTHGQKDCLECPVSE
SQPVSVVKAYQKLCYIHHIMGKVPDACTACDLVNVLDLDCIFEQZ

FIG._1

atgccccgggtttacagattgtgattaaggctcccaagcgacccttgacgagcatctgccccca
tttctgacagctttgtactgggtggccagaaggatgggagtggccagatctgcacat
ggatctgaatctgttgcaggcggccatgttgcggccatgttgcggccatgttgcacat
acggatataggccggctgttgcaggatggccggccatgttgcggccatgttgcacat
agactactttccatcatgcacgtgtctgttgcggccatgttgcggccatgttgcacat
ccatgttgcaggatggccggccatgttgcggccatgttgcggccatgttgcacat
ccaaactgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcacat
atgttgcacatcccaattacttgcctccaaaacccagcttgcagttccactgttgcggccatgttgcacat
tatgttgcacatgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcacat
ctggccatgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcacat
cggtgatcatcaaaaacttcagccaggatcatgttgcggccatgttgcggccatgttgcacat
gattacttcggagaaggatccgttgcggccatgttgcggccatgttgcggccatgttgcacat
tccaacttcgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcacat
aaaccgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcacat
tatataattttgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
acggaaaatgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
acatcgccggaggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
cttt
aaggctgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
agtcttcgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
gatttgacggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
gaacttcaccgcggctgttgcggccatgttgcggccatgttgcggccatgttgcggcc
tccgggtggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
caaaaaaaaggatcatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
ggccatgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
gttctcgatgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
gaattcaaccgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
tctcaaccgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
gaaagggtccagacgttgcggccatgttgcggccatgttgcggccatgttgcggccatgttgcggcc
tgaacaataa

FIG._2

MPGFYIEIVIKVPSDLGHLPGISDSFVNVAEKEWELEPPSDMDLNLIEQAPLTVAEKLQRDFL
TEWRRVSKAPEALFFVQFEGESYFHMHVLFVETTGVKSMVLGRFLSQIREKLIQRIYRGEPTL
PNWFAVTKTRNGAGGGNKVUDCEYIPIPNLLPKTQPELQWAQWTNMEQYLSACLNTERKRLVAQH
LTHVSCTQEKENQNPNSDAPVIRSKTSARYMELVGWLVDKGITSEKQWIQEDQASYISFNAA
SNSRSQIKAALDAGKIMSLTKTAPDYLGVQQPVEDISSNRIYKILELNGYDPQYAASVFLGWA
TKKFGKRNTIWLFGPATTCGKTNIAEAIATHTPVYFGCNWNTNENFPNDCCVDMVIWEEGKMTA
KVVESSAKAILGGSKVRDQCKSSAQIDPTPVVTNTNCVIDGNSTTFEBHQQLPQLDRMFKF
ELTRRLDHDFGKVTQEVKDFFRWAKDHVVVEHEFYVKKGGAKKRPAAPSDADI SEP KRVRESV
AQPSTSDEAESINYADRYQNCKCSRHVGMNMLFPCRQCEMRNQNSNICFTHGQKDCLCFFVSE
SQPVSVVKAYQKLCYIHHIMGKVPDACTACDLVNVLDLDCIFEQZ

FIG._3

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atgcgggggtttacgagattgtattaaggccccagcgacccttgacgagcatctggccggca
tttgcacgacttggactggggccggagaaggaaatggggatgtggccggcaggatctgacat
ggatctgaatctgatggacgggccccctgaccgtggccggagaaggctgcggcacttttc
acggaatggccggtgtgatgaaaggccccggaggcccttttttgcataatttgagaaggag
agagacttccacatcgactggctggaaaccacccggggtaaaatccatgtggccgg
tttccatggatcaggatcgaaaaaaatgttgcagaaaatttacccgggatcgaccgttt
ccaaactgggtcgccgtcacaagacccagaatggccggggaggcgggaaacaagggtgtgatg
agtgtcatactcccaaatttgcgtcccccacccggccgtactgcgttcaggccggggctggactaa
tatggaaacagttatggccgttggatctcgcggcgttgcggccgttgcggccgc
ctgacgcacgtgtcgccagcgcaggagcagaacaaagagaatcagaatcccaatttgc
cggtgtcagatcaaaaaaaaattccgcggatctggatggctgtggccgttgcggacaagg
gattacccggagaaggactggatccaggaggaggaccggccatcatacatcttccatggcc
tccaactcgccgtccaaatcaaggctgcctggacaatgcgggaaagattatgagctgacta
aaacggcccccgcgtactccgtggccgcaggcggccgtggaggacatttccggcaatctggat
taaaattttggaaactaacgggtcatgcattttccatgcggccgttgcggatggggcc
acgaaaaaaatgtccggcaagggaaacccatctggctgtttggccctgcactaccgggaaagacca
acatcgccggaggccatggccacactgtggcccttcatgggtggccgttgcggccatggaa
cttcccttccaaacgttgcagatgttgcggccatggatctggccggaggggggaaatgaccgg
aaggctgtggagtcggccaaaggccatttcggaggaagcaagggtgcgtggaccaggaaatgca
agtctggcccccgcgtactggccgttgcgtccatcccaacccaaatctggccgg
gattgcgggaaactcaacggttgcacacccaggccgttgcggccgttgcggccatggat
gaactcaccgcggctgtggatcatgactttggaaaggcttgcaccaaggcggaggatca
tccggccggccaaaggatctgggtgggggggggggggggggggggggggggggggggg
caaaaaaaaggccggcccccgttgcggccatggatca
ggcggccatcgacgtcagacggaaagcttgcgttgcacactacgcggccatggat
gttctgtcgtactggccgtatgaatctgtatgttgcgttccctggccggccatggccgg
gaattcaatatttgcgttgcactcggccggccatggatctggatgttgcgttccctggcc
tctcaaccgggtttctgtcgccaaaggccgtatcagaactgtgttgcattcatatcatgg
gaaagggtccggccatggccgttgcactgcgttgcgttgcgttgcgttgcgttgc
ttaacaataa

FIG._4

MPGFYIEIVLKVPSDLDEHLPGISDSFVSWVAEKEWELPPDSMDMLNLEIQAPLTVAEKLQREFL
VEWRRRSKAPEALFFVVQFEGKSYFLHLLVETVGVSKSMVYGRVSQIKEKLVTLYRGVEPQL
PNWFATVTKTRNGAGGNGVNWKDDCYIPYNLLPKTQPELQWQAWNTNDMQYISLNLAERKRVLQAHH
LTHVSQTEQEQNKENQNPNSDAPVIRSKTSARYMELVGWLVDRGITSEKQWIQEDQASYTSFMAA
SNSRSQIKAALDMSKIMSLTKTADPLVQGNPPEIDISNRNRYILEMNCYDPVQWAEVFLGWA
QKKTGKRNTIWLFPGATTGKTNIAEAIAAHVPGCVNWTNENPFNFNDVCKDMVYIWEASGKMTA
KVXESCAKILGGSKVRUDQCKKSAAQIDPTPVITVTSNTNMCAVIDGSTTFEHQQPLQDRMFKF
ELTKRLEHDFGKVTQEVFRFRWASDHVTETVTHEFYVRKGGAQRKRPAPNDADISEPKRACPSV
AQPSSTDSEAEPDVADRYQNKCSRHGVNMMLFPCRCQRCEMNQNVDCIFTHGVMDCAECFPVSE
SOPOVSVURKRTYOKLCPIHIMGRAGEPACASACELANVLDLDDCDMEQ

FIG.-5

atgcgggggttctacgagatcgtgtgaagggtcccgacgcacctggacgacccgcgc
tttctactttttgtggctggggccaaaggaaagggtggggacttcggccggatcat
ggacttgaatctgttggcaggccccctggccggaaaggctggccggatcat
gtcgagtggccggcgtgagaatggcccccggaggcccttcttgccttgcggcc
acatgcattccaccctgcacatcttgcggatggggccggatccatccatgttgcggcc
atcgtgaggccagataaaggaaaggatgttgcaccgcgtatctaccggggcc
ccgaactgttgcggtgaccacaaggacgcgtaatggccggaggccggaaaagggtgtggac
actgtcatacccccacttcgtcccccggacccggccggacttcgtggccggactaa
ttggccaggatataaaggccgttgcgttgcgttgcggccggatcat
ctgacgcacgtgtcgcagacgcggaggacaaacaaggaaaaccggaaaacc
cgttgcgttgcggatccatgttgcggatccatgttgcggatccatgttgcggcc
gtacacgtcggaaaaggatgttgcggaggacccggatccatgttgcggatcc
tcaactcgccgtcacaatcaaggccggctggacatgcctccaaatcatgagcc
agacggccgtggactaccatgttggccggaaaggccggggatcatccggcc
ccgaatccctggatcatggccgttgcgttgcggccggatcat
aaaagaaggatcggagggaaaccatctggctttggccggccacggatgg
acatcgcggaaaggccatccggccggccgttgcgttgcggatccatgttgcgg
tttgcgttgcgttgcggatcatgttgcggatccatgttgcggatccatgttgcgg
aaggctgttagagagccaaaggccatctggccggaaagggtgcgtggcc
actgtatccggcccatgttgcgttgcgttgcggccggatcat
catcgccggaaaactcgaccatccgtcggccggatcat
gagctcaccatccggccgttgcgttgcggatccatgttgcggatccatgttgcgg
tccggccgttgcgttgcgttgcggatccatgttgcggatccatgttgcggat
tagaaaaaggccggcccccataatcgccggatataatgttgcggcc
ggccggatccatgttgcgttgcggatccatgttgcggatccatgttgcggat
ggccggatccatgttgcgttgcggatccatgttgcggatccatgttgcggat
gttctgtggatccatgttgcgttgcggatccatgttgcggatccatgttgcggat
gtatgttgcggatccatgttgcgttgcggatccatgttgcggatccatgttgcggat
tctcaaccctgtgtgtcgtcggatccatgttgcggatccatgttgcggat
tggggaggggccggccggatccatgttgcgttgcggatccatgttgcggat
tgcataatgttgcggatccatgttgcggatccatgttgcggatccatgttgcggat

FIG.-6

MPGFYEVILVKVPSDLDEHLPGISNSFVNVAEKEWELPPSDMDPNLIEQAPLTVAEKLQREFL
VEWRRVSKAPEALFFVQFEKGTYFLHVLVLTETIGVKSVMVGVRYSQIKEKLVTYRVEPQL
PNWFVAVTKTRNGAGGGNKKVVDCCYIPNLYLLPKTQPELQWAFTNDMQYLSCALNLAERKRLVAQH
LTHVSQTQONKENQNPNSDAFVIKSSTSARYMELVGWLVDRGITSEKQWIQEDQASYIISFNAA
SNSRSQIKALAENDASKIMSLTKTAPDYLGVGSNPPEDTIKNRNYPQILEEYHGDYQPAASVFLGLWA
QKQFGKRNTIWLFPGATTGKTNLIAJAHVPTFYGCWNWTNENYFPFDNCVDKRMIVIWEEGKMTA
KVVESSAKALLGGSKVRDQCKCSAQIETPTVIVTSNTNMCAVIDGNSTTFEBEQQLPQDRMFKF
ELTRRLDHDFGKVTKQEVKDFR WASDHVTDV AHEFYVRKGGAKR P AS ND AVS E PKR Q C T S L
AQPTTSDAEADYADRYQNKSRCRVGMNLMLFPC KTC ER MN Q S IN C V F TH QR D C G E C F P G M S
ESOPVSVKKKTYOKLCPIHHILGRAPEIACSDANLVLDDCVSE

FIG.-7

FIG._8

MPGFYEVILVKVPSDLDERLPGISNSFVNWVAEKEDWDVPPSDMDPMLIEQAPLTVAEKLQREFL
VEWRRVSKSPEALFFVQEKGTYEFLHVLLEITIGVKSVMVGRYVSQIKEKLFVTRYRGVEPL
PLNWFAVTKTRNGAGGGNKVVDDCYLPNLYLLPKTQPELQWAUTNMQDYLASCLNLRAERKRLVAQH
LTHVSQTOQNKENQNFNSDAFIRSSTSARYMELGVWLVDRGITSEKQWIQEDQASYISFNAAM
SNSRSQIKAALDNASKIMSLTKTAPDLYVGSNPPEDTCKRNYQILELNGYDPQYAAVSFLGWA
QKFKGKRNTIWLFGPATTCGKTNIAEEAIAIQLTPEVYFGCVNWTNTENFPFDNCVDRMVIIWEEGKMTA
KVVESSAKALLGGSKVRDVQCKSSAQIPEPTVIVTSNTNMCAVIDGNSTTFHEHQQLPQDRMFEF
ELTRRLDDHDFGKVTKQEVKDFFRWASDHVTDVAFHEFYRKGGAKKRPASNDADVSEPKRECTSL
AQPTS TSADAEPADYADRYQNKCSCRHVGMLMFLPCCKTERMNQIISNVCFTHGQRDCGECFPGMS
ESQPVSVKKRTQYKLCPIIHLGRPAEILACSDANLVDLDDCSEQ

FIG.-9

atgcgggggttctacgagattgtcctgaagggtcccgagtgacctggacgcgcgcgcgcggca
tttcaactctgttgttaacgggtggccagaaggaaatggacgtgcgcgcggattctcgat
ggatccgaatctgttgagcaggcacccctgaccgtggccggaaaagcttgcggatgttcctg
gtggagtgccgcgcgtgagaatggccccggaggcccttttgcgttccatggaaaggaaaa
agacacttccacccatgtcgatgttgcggatggccatggggccaaatccatgttgcgcgc
ctacgtgagccaggataaaagagaatgttgcggccatgttgcggatgttgcggatgg
ccgaactgttgcggatggccaaaacggaaaatggcgcggggggggacaagggtgtggac
actgtcatatcccactactgttgcggccatggccggccatgttgcggatgttgcggat
atggggaggatattatggcgtgttgcgttgcggatgttgcggatgttgcggat
ctgacgcacgtgtccagacgcaggaggcagaacaaaagagaatcagaaccccaattctgcgc
cggtcatcaggtcaaaaacctcagccaggatcatgttgcggatgttgcggatgttgcgg
gatcagtcgaaaagcaatgttgcggatgttgcggatgttgcggatgttgcggat
tcaactcgcgtcccaatgcggccgcgtggacaatgcgttcaatgcgttgcggat
agacggctccgactacccatgttgcggatggccaaatggccggggaggatccaaaatggatcta
ccaaatctgttgcggatgttgcggatgttgcggatgttgcggatgttgcggat
ccaaaaggatgttgcggatggggaggaaacaccatgttgcggatgttgcggatgttgcgg
acatcgccgaaggccatgtccgcgcgcgcgcgcgcgcgcgcgcgcgcgc
cttgcgttccatcggatgttgcggatgttgcggatgttgcggatgttgcggat
aaatgttgcggatgttgcggatgttgcggatgttgcggatgttgcggatgttgcgg
actcatcgcccaatgttgcggatgttgcggatgttgcggatgttgcggat
gattgttgcggatgttgcggatgttgcggatgttgcggatgttgcggatgttgcggat
gacttacccgcgttgcggatgttgcggatgttgcggatgttgcggatgttgcggat
tccggatgttgcggatgttgcggatgttgcggatgttgcggatgttgcggat
taagaaaaacgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgc
gttgcgttgcggatgttgcggatgttgcggatgttgcggatgttgcggat
gttgcgttgcggatgttgcggatgttgcggatgttgcggatgttgcggat
aattttcaatgttgcgttgcggatgttgcggatgttgcggatgttgcggat
gaatctcaatccgttgcgttgcggatgttgcggatgttgcggatgttgcggat
tcttgcggatgttgcggatgttgcggatgttgcggatgttgcggatgttgcggat
ctgttgcggatgttgcggatgttgcggatgttgcggatgttgcggatgttgcggatataa

FIG._10

MPGFYIEIVIKVPSDLDHEHLPGISDSFVSWAEKEWELPPDSMDMLNLIEQAPLTVAEKLQRDFL
VQWRRVSKAPEALFFFVQFEKGESYFHLHILVETTGVKSMVLGRFLSQRDKLVQTIFYRGEIPTL
PNWFAVTKTRNGAGGGNKVVDCEYIPNYLLPKTQPELQWAWTNMEEYISACLNLAERKRLVAQH
LTHVSQTQEQNKENLNPNSDAPVIRSKTSARYMELVGWLVDRGITSEKQWIQEDQASYISFMAA
SNSRSQIKAALDNAGKIMALTKSAPDYLVGPAPPADIKTNRIYRILELNGYEPAYAGSVFLGWA
QKRFGKRNTIWLFPGATTGKTNIAEAIAHAFVYFGCVNWTNNENFFNDVCVKMVWIWEEGKMTA
KVVESAKAILGGSKVRVDQKCKSSAQIDPTPVIVTSNTNCAVIDGNSTTFRHQPLQDRMFKF
ELTRRLEHDFGKVTQEVKEFFRWAQDHTVEAHEFYVRKGGAKNRPAAPDDADRKSEPKRACPSV
ADPSTSDAEGAPVDFADRYQNKCDSRAGMLQMLFPCKTCERMNQNPNFNICFTHGTRDCSECFFGV
SESQPVVRKRTYRKLCAIHLLGRAPEIACSACDLVNVLDDCVSEQ

FIG._11

FIG.-12

MPGFYEVIVKPSDLDEHLPGISDSFVNVAEKEWELPPSDMDLNLIEQAPLTVAEKLQRDFL
VQWRRVSKAPEALFFVTEKGESYFHLLHLVETTGVKSMLVGRFLSQRDLCVTLQTYRGEIPL
PNWFVAFTKTRNGAGGGNKKVDECYIPNYLLPKTQPQELQWAUTNMEEYISACNLLAERKRLVAHD
LTHVSQTQENKENLNPSDAFVIRSKTSARYMELVGWLVDRGITSEKQWIQEDQASYRIFSVNAA
SNSRSQIKAALDNAGKIMALTCKSAPDYLVGPAPPADIKTRNIYRILELNGYDPAVAGSWSVFLGW
QKRGFKRNTIWLFPGPATPGTKNIAAHAVPFYGCWNWTNEINPFFNDCVDRMVIIWEEGKMTA
KVVESSAKALLGGSKVRVQDKCKSSQAQIDPTPVTFITSTNTMCAVIDGNSTTFHEHQOLPQDRMFKF
ELTRRLEHDHGKVTQKEVKEFFRWAQDHVTTEVAHEFYVRKGGAHKRPARPDDADKSEPKRACP
ADPSTSDAEAGAPVCFADRYQNKCSRSRAGMLQMLFCPTCERMNQNFEICFTGTRDCSECFFGV
SESOPVWFRRTYRKCAIHLLGLGRAPIEACASCDLVNVLBLLDDCGVSEO

FIG.-13

atgcgggggtttacgagattgtgattaaggccccagcgacccttgcagacatctgccccca
tttctgacatcttgcactgggtggccagaaggaaatgggatgtccgcagattctgacat
ggatctgaatctgattgagcaggcacccctgaccgtggccagaagctgcagcgcacttcctg
gtccagtggccgcgtgagaaggccccggaggccctttttgttcagttcgagaaaggcg
agtccacttacctccatattctgttgagaccacgggggtcaaattccatgttgcggcc
cttcctgtcagattggagaacgctgtgcagaccatctaccgcgggatcgcggcc
cccaactggttcggtgaccaagacgcgtaatggcgcggagggggaaacaagggttgtggacg
agtgcacatccccaaacttccgtcccaagactcggccagactgcgtggggcgtggactaa
catggagagatataagcgcgttttaaccatgcggcagccaaacggctcgtggccacgc
ctgaccacgtcagccagaccaggagcagaacaaggagaatctgaacccaattctgacgcgc
ctgtcatccggccaaaaactccgcacgcgtacatggactgttgcgggtggaccgggg
catcaccatccggagaagcgttgatcggaggaccaggccctgtacatctccatcaaccgcgc
tccaactcgccgtcccagatcaaggccgcctggacaaatgcggcaagatcatggcgtgacca
atccgcggccactacccatgttgaggccccctcccccggcagataaaacccacgcattta
ccgcattctggagtcgaaacgcgtacaccgtctacggccgttgcgttgcgtgggg
cagaaaagggtcgaaaacgcacacccatctggctgttggccggcaccacggcaagacca
acatcgccggaaacgcattccgcggccatccgttgcgtcaactggaccaggaa
cttcccttcacccatgttgcgtcagatggatctgttgcggaggaggcaagatgcggcc
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atgtgacgggaaacgcacccatctggagcaggcgcgttgcaggaccggatgttcaattt
gaactcaccgcgtctggagcatgacttggcaagggtacaaaggcaggaaagtcaaaagatgtt
tccgtccggccaggatcgttgcggccatgttgcgttgcgttgcgttgcgttgcgttgcgt
caacaagacccgcggccatgtacgcggataaaacgcggcccaacgcggccctgcgttgcgt
gcggatccatgcacgtcagacgcggaggatcgttgcgttgcgttgcgttgcgttgcgt
aatgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
tcagaatttcacatgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
tcagaatctcaaccggcgtcagaaagagagacgtatcgaaactctgtgcattcatctgc
tggggccggcgtcccgagattgttgcgttgcgttgcgttgcgttgcgttgcgt
tggggccggcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt

FIG._14

MPGFYEVIVKVPSDLDEHLPGISDSFVNVAEKEWELPPSDMDLNLIQEAPLTVAEKLQRDFL
TEWRRVSKAPEALFFVQFEKGEYSFHMHVLVETTGVKSMVLGRFLSQIREKLIQRIRYRIEPTL
PNWFAVTKTRNGAGGGNKVUDCEYIPNYLLPKTQPELQWAUTNMEQYLSACLNTERKRLVAQH
LTHVSQTQEQNKENQNPNSDAPVIRSKTSARYMELVGWLVDKGITSEKQWIQEDQASYISFNAA
SNSRSQIKAALDNAGKIMSLTKTAPDYLVGQQPVEDISSNRUYKILELNGYDPQYAASVFLGWA
TKKFGKRNTIWLFGPATTTGKTNIAEAIATVPUFYGVNVNTNEONPPNDVDKMVVIWEEGKMTA
KVESAKAILGGSKVRVDQCKSSAQIDFTPVIVTSNTNMCAVIDGNSTTFEHQQPLQDRMFKF
ELTRRLDHDFGKVTKQEVKDFRWAKDHVVEHEFYVKKGGAKRPAPSADISEPKRVRESV
AQPSSTDSEAISINYADRLARHGSL

FIG._15

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atgcccgggttttacgagattgtgattaaggcccccagcgacccgtgacgagcatctgccccggca
tttctgacacttgcactgggtggccgagaaggaaatgggagtggccgcgacattctgacat
ggatctgaatctgattgagcaggcacccctgcaccgtggccgagaagctgcagcgcgactttctg
acggaaatggccgcgtgtgagaaggccccggaggccctttttgtcaatttgagaagggag
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agtgcatactcccaattctgtcccccacccggctgagctccagtggcgtgtgactaa
tatggaaacatgtttaaggcgttgcgatccgcggcgtaaacgggttgcgcagcat
ctgacgcacgtgtcgacgcaggcaggcaggcagaacaaagagaatcagaatcccaattctgtgcgc
cggtgcgatcatggaaatccgcggcgtacatggactgtggccgtggcgtggacaagg
gattacccgcgaaagcagtggatcaggcaggcaggccgtcatacatctcttcgcggcc
tccaactcgcggcccaatcaaggctgccttgacaaatgcgggaaagattatgaggctgacta
aaaccgcggccgactacctgtggccgcagcggccgtggaggacatttccagcaatcgattta
taaaatttgcgactaaacgggtacatgcattccatgcggccgttgcgtttctggatgggccc
acgaaaaatgtcgcaagaggaaacaccatctggctgtttggcgtcaactaccggaaagacca
acatcgccggaggccatagcccacactgtgccttctacgggtgcgtaaactggaccaatggaa
cttcccttcacgcgtgtgcagatgtgtgatcttgcggaggaggggaaatgaccggcc
aaggcgtggagtcggccaaagccattctcgaggagaagcaagggtgcgcgtggaccaggaaatgca
agtctcgcggccatagatggccgactccctgtgcgtccacccaaacaccatgtgcggcc
gattgcgggaaactcaacgcaccgcgttgcacccaggcgcggatgttcatttt
gaactcaccgcgcgttgcgatcatgacttggaaaggtcaccaagcaggaaatgtcaaaagacttt
tccgggtggccaaaggatcacgtgtggatggcgtggatcatgaaatctacgtcaaaaagggtggagc
caagaaaaagaccgcggcccccagtgcgcagatataatgtgagcccaaacgggtgcgcgtggat
ggcgcggccatgcacgtcagacgcggaaatctgcataactacgcagacagatcttggggcaac
ctcggacgagc

FIG._ 16

MPGFYEVIVKVPSDLGDHLPGIDSFVNVAEKEWELPPDSMDLNLIEQAPLTVAEKLQRDFL
TEWRRVSKAPEALFFFVQFEKGESYFHMHVLTETTGVKSMVLGRFLSQIREKLIQRIYRGEPTL
PNWFAVTTRNGAGGNKVVDCEYIPNYLLPKTQPELQWAUTNMEQYLSACLNLERKRLVAQH
LTHVSQTQEONKENQNPNSDAPVIRSKTSARYMELVGWLVDKGITSEKQWQEDQASYISFNAA
SNSRSQIKAALDΝΑΝΑΚΙΜΣΤΚΤΑΡΔΥLVQQPVEDISSRNΙYKILELNGYDPQYAAASVFLGWA
ΤΚΚFGKRNTIWLFGPATTGKTNIAΕΑΙΑΗΤΡPFYGCVMWTNENPFNDVCVDKΜVΙWEEGKMTA
KVVESAKAIΛGGSKVRVDQKCKSSAQIDPTPVIVTSNTMCΑVIDGNSTTFEHQQPLQDRMFKF
ΕLΤRRLDHDFGKVTKQEVKDFRWAΚDHVVΕΕΗFYVKKGAKRPAPSADISEPKRVRESV
AQPSSTDΕΑSINYADRLARGHSL

FIG._ 17

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FIG._18

MELVGWLVDKGITSEKQWIQEDQASYISFNAASNSRSQIKAALDNAGKIMSLTKTAPDYLVGQQ
PVEDISINRNYKILENLGVYDPQAASVFLGWATKKPGKRNTIWLFGPATTCGKTNTIAEAIARHTVP
FGCVGWNNTENFPFDNCVDKMVWIWEEGKMTAKVVESAKAIIILGGGSKVRDVQDKCCKSSAQIDPTPV
IFTNTSNMCAVIDGNSTFEEHQQLQDRMFKFEFLTRRLDGFVKTVQEKVDFTFRWAHDHVVEE
EHEFYVKKGGAKKRPAPSDADISEPKRVRESVAQPSTSDAEASINYADRYQNKCSCRHVGMLML
FFPCRQCERMNQNSNICFTHGQKDCELCFVSESQPVSVVKKAYQKLCYIHHIMGKVPACTACD
LNVNLDLDDCTIFEO

FIG._19

FIG.-20

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MATFYEVILVRVPFDVEEHLPGISDSFVWDVTGQIWLPEPESDLNLTLTVEQPQLTVADRIRRVFL
YEWNKFSKQESKFVVFQGEKFSEYFHLTLTVESTGSISSMVLGRYVSQIRALQVVFVQGIEPQIN
DWWAIVTKVKGGKANKVVFQGTYIPAPLLPKVQPELQWAVNTNLDEYKLAAALNLEERKLRVAQFLE
SSQRSEQEAAQSREFSADPVIKSSTSQKYMALVNWLVEHNGITSEKQWIQEENQESYLSFNSTGNSR
SQIKIAALDNTKMSLTSKTSADYVLFVGSSVPKRNKRWIQFEMNGYDPAYGASLILWYGMTCRQVSE
NKRNTVWLGYGATTGKTNTIAEALIAHTPVFYGCVNWTNEPFNFCDVCKMLIWWECKTMNKVSE
SAKALLGGSKVRDQKCKSSVQIDSTPVIVISNTNCVVDGNSTTFEHQOPPLEDRMFKFELTK
RLPPDFGKIKTQEVKDFFFAWAKVNQVPVTHTFKVPUERLAGTKGAEKSLSKRPLGDVNTTSYKSL
KARLRSFVPTPERSSSDVTVPDAPLRLPNNSRYSRDKCDYHAQFDNISNKCDECEYLNRGKNGC
CHNVTHCOICHGJPPWEKEENLSDGFDDANKEO

FIG.-21

atggctaccccttatgaagtcatgttgcgtcccattgacgtggaggaaacatctgcctggaa
tttcgtacgacttttgtggactactgtcaattttggagactcgtccctcccgaggatcagattt
aaatttgactctggtaacacgcgcctcagttgcgggtgtatagaatttcgcgcgttgcgt
tacgagtggacaacaaatttccaacgcaggagtccaaatttttgcgttgcagttgaaaaggatctg
aatattatctgcacacgcgttggagactccgcgtatcttcattgttgcctccggcgttgcgt
cgttgcgttgcattgcgcggcaggatgttgcgttgcgggttgcgttgcgttgcgt
gactgggtgcgcattaccaaggtaaaaaggcgaggccaaataagggtgttgcgttgcgt
ttcccgccatctctgtcgccgaaagggtccaaacccggagcttcagttgcgttgcgttgcgt
gtataaaatttgcgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
tccctgcaggcgtcgcaggaggccgttgcgcgttgcgttgcgttgcgttgcgttgcgt
gcaagacttcccagaatatacgccgtcgtcaactgttgcgttgcgttgcgttgcgt
gaaggactggatccaggaaaatcaggaggactacccttcatttcgcgttgcgttgcgt
accgcgatcaaggccgcgtcgcacacgcgcacaaaattatgttgcgttgcgttgcgt
actacctgtggggagactcggttcccgaggacatttcaaaaaacagaatctggcaatttttga
gtatgttgcgtacgaccggccatcaggccgttgcgttgcgttgcgttgcgttgcgt
acaacaggaaacacccgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
ccatccccacactgtgcctttacggctgcgttgcgttgcgttgcgt
tgactgttgccaaaaatgttgcgttgcgttgcgttgcgttgcgttgcgt
tcccgccaggccatctgggggtgtcaagggtgcgggtgtatgcgttgcgttgcgt
aaattgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
ttccacgcatttgcacaccgcgcggccgttgcgttgcgttgcgttgcgttgcgt
cggttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
aggtaatcagggttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
aggtaatcagggttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
ggccggagaaatcttcaaacgcgcacttgggttgcgttgcgttgcgttgcgt
acggccggccagggttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
cttcctgtcgccgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
tgacaacatttctaacaatgttgcgttgcgttgcgttgcgttgcgt
tgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
cagatgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt

FIG.-22

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MELVGWLVDKGITSEKQWIQEQQASYISFNAASNSRSQIKAALDNAGKIMSLTKTAPDYLVGGQ
PVEDDISNRNRYLKEFLNDYGPQYAASFLGWATKKFRGKRNTIWLFGPATTGKTNIAEIAHTWP
FYGCVNWTNENPFNDCKVDMWIIEWEGKMTAKVVEASAKAILLGGSKVRWDQCKCSAQIDPTPV
IVTSNTNMCAVIDGNSTTEFHQQQLQDRMFKEFLTRLDHDGKVTKQEVKDFRRWAHDEVVVE
HEFVEYUWKGGAKRPPASDADISEPKVRVESVAOPSTSDAEASINYADRLAHRGHSI.

FIG. 23

atggagctggcggggtcggtggacaagggattacactcgaggagaacgcgtggatccaggagg
accggcctcatacatctccctcaatgcggccctccaatctcgccgttccaaatcaaggctgcctt
ggacaatcgggaaaggatattgacgtctgactaaaccccccggactacttgtggccaggcagg
ccctgtggaggacatttcggcaatcggtttataaaaattttggactaaacgggtacgatcccc
aatatcgccgtccgtttcttgcggatggccacggaaaggatcgccggaaaggacactatcg
gtgttggggcgtcaactacggggaaaggccaaatctcgccggaggccatagcccacactgtgg
ttctacgggtcgtaaactggaccatgagaactttccctcaacgactgtgtcgacaaagatgg
tgatctgtggggaggaggggaaaggatgcggccaaagggtcggtggactgcggccaaaggccatctcg
aggagaacgggtcgccgtggaccggaaatgcggacttccgtccggccagatgaccggactccgtg
atcgtcacccaaacacccatgtgcggctgttgcgggaaactcaacgacccatcgaaacacc
agcggccgtcaacaggccatgtccaaatggactaccggcccgctgtggatcatgactttgg
ggagggtaccaacaggcggaaatggactttccgtggccaaaggatcatcggttgggtgg
gagcatgaatttcacgtcaaaaagggtggagccaaaggaaacccgcggcccccagtgtacgcagata
taatgtggccaaacgggtcgccgagtctggccggccatcgactcgacacgcggaaagctt
gtatcaactacggccaggacatctttggggccaaacctcgccggac

FIG. 24

MAFSRPLQISSDKFYEVIRLRLSDIDQDVPGLSLNFWVWLSTGVWEPTGIVWNMEHVNLPMVTLADKIKNIFIQRRWNQFNQDDETDFFFQLEEGSEYIHLHCCIAQGNVRSFVLRGYMSQKDISLRLDVYEGKVKIPFWSITKTKRGGQNKVTAAATYILHYLIPKKQPELQWAFTNMLPTAAACLCQKRQEFLDAFQSEMMNAVQEDQASTAALPISNRANKNSLNDWLIEIMITESQEWLTKENESRYSFCATSSNNRQVKAALENARAMELLTKTATDYLIGKDPVLIDITKNRYIQILKLNNYNPQYXGSVLCCWVKFRKFNRKNAIWLYGPATGTKNTLAEALAHAVPFYGVNWTNEFPFNDVCVKMILWEEKGTMKVVVESAKALLGGSAVRDQCKCGSVCIEPTPVITSNTDMCVMIDVGSNTTMEHRIPLLEERMKQIVLSHKLEGNGFKISKKEFFWKANDNLVPPVSEFKVPTNEQTKLTEPVPERANEPESEPPR1IWAPTFREEELIRLASPEFLASVAPLPPSSDTSPKRKTRGEYQVRCAHMSLSDNMSMVFECLERANAPFOFOSLGENFCNCNOHGWDYCAFNCNELKDDMMNEIHFVADDMNEO

FIG.-25

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FIG.-26

MALSRRPLQISSLKDIFYEVIRLSSDIDQDVPGSLNFVEWLSTGVWEPTGIWNMEHVNLPMTLA
EKIKNIFJQRWNQFNQDDEFDFQFOLQESEYIHLHCCIAQGNGVRFSVGLGRYSQIKDSIRDYV
EGKQIKIPDWFAITKTGRRGGQNKVTAAYLILHYLIPKKQPELQWAFTNMPLTAAALCLQRQEE
LLDAFQESDLAPLPDPQASTVAPLISNRRAAKNYSNLVDWLIELMIGTSEKQWLTERESYRSFQ
ATSSNNRQVKAAELENARAEMMLTKTATDYLIGKDPFLDITCKTNRVYQQLKMMNNYQQYIGSILCG
WVKRFENKRNAIWLGYPATGTGKNTNIAEIAAHAVPFYGVNCWNTNEPPFNDCKDVKMLIWEEGKM
TNKVVSEAKAILGGSAVRDQCKKGCSVCIETPTPVIIITSNTDMCMIVDGNSSTMHEIRPLLEERMF
QIVLSHKLEPSFGKLSKKEVREFFKWDANLVPVVSFEFKVRTNEQTNLPEFPVERANEPEEPPK
IWPAPPTEEEELLRASPELFSSVAPIPTVQPNSSPEPKRSRNYYQVRCALTYDMSMDVFECME
CEKANFPEFQFOLGENGYCDEHWGDCAICKELNKLAELEHVFELDAAENEQ

FIG.-27

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FIG.-28

MAFSRPLQLQISSDKFYEVIIIRLPSIDQDVPGSLNFVWELSTGVWEPTGIWNMEHVNLPMTLA
DKKINIFJQRWNQFNQDDEFDDFFQLEGESEYIHLHAWCPGECRSFVLGRYMSQIKDSILRUDVYE
GKQVKPWFDSITSKTRGGQNKTVTAAYILHYLIPKKQFELQWAFTNMPLFTTAACALCLQRKQEL
LDAFQESEMNAVVQEDQASTAAPILSNRAAKNYSNLWDLIEGMITSEKQWLTKENKEYSRFQAF
TSSNNRNQVKAALENRAEMLLTKTATDYLIGKDPDLITKNRIRYQILKLNNYNPQYVGSVLCGW
VKREFNRKNAIWLYGPATGKTNIAEAJAHAVPVFGCWNNTMFPIFNFDCVDKMLIWEEKGMT
NKVVESEAKAIIGLGSAAVRDQCKGKGSVCIEPTVIIITSNTDMCMIVDGNSSTMTEHRIPLEREMFQ
IVLSHSKLEGNGFKISKKEVKEFFKWANDNLVPVVSEFKVPTNEQTKLITEPVPERANEPEPPK
WAPPFTREELEEILRASPELFAVPLSPSPTDTSRKKTRGEYQVRCAHMSLDNSMNVFECLEC
ERANFPFEOSLGENFCNQHGWYDCAFCNELKDDMNEIEHVAIDMMNEO

FIG.-29

FIG._30

RPELQWAFTNMPLFTAALCLQKRQEELDDAQESDLAFLPDPQASTVAPIISNRRAKNYSNLVDWLIMEGITSKEQKQLTENRYSQFATSSMNRRQVKAALENARAEMLTTKTTADFLIGKDFVLDITKRNVRQYQILKHMNNYNNPQYIGSILCGWVKRTRNKAHLWLYGPAFTGKTNAEIAAHAVFYGCVNWTNTTQFPTFNDVCKDMLIWWEEGKMTNKVVESEAKAALLGGSASRVQDVQCKRGKSVCIEPTPVIIITSNTDMCMIVDGNSTMTEHRNPLERMFQVFLSHKLEPSFGKISKKEVREFFFKWANDNLVPVVSSELKVRTNEQTNLPEFPEVPERANEPEEPPKIWFAPPFTREELEELLRSAPLEFSVSAVFLVTWPQNSEPKRSRNRNYQVRCALHTYDNSMDVFECMCEKANFPEFQPLGENYCDDEHGWYDCAICKEKLKNELAEI
EHVFLDDAEAEQO

FIG._31

cgacctgaactgcagtggcccttaccaatatgcctttatattactgctgtgtctttgtctgc
aaaagcggcaagaatgtctggatgcatttcagaagagactgttggccccccttacgtatcc
tcaaggcatcaactgtggcacccgttattttccaaacagagccgaaagaactatacgcaaccc
gattggctcattgaaatggcataacatctgagaagcaatggctactgagaaccgagagagct
acagaagacttcaagcaacttccaaataatgacaactgtaaagctgactggagaatggcccg
tgctgttaaatgcttataacaacaaagactgcaactgattactgtatggaaaagaccctgtctggat
ataactaagaacacgggtctatcaaattctgaaaatgataactacaacccctaatacatagaa
gtatccctgtgcggctgggtgaagagagactgtcaaaaaaaagacccatatggcttacggacc
tgccaccacccggaaagaccaatcgagaagacttgcattggccatgtgttaccccttataatggct
gttaactggactaatgagaactttccctttaatgattgtgttataagatgctgattgggtgg
aggagggaaaaaaatgactaaatgtgttgaatctgcaaaaaagcaattttggaggggttgcgt
ccgggttagaccagaatgtaaaggatctgttgttattgaaacactctctgtatattaccagt
ataactgatatgttatgttgcactactacaatggaaatagataatcattag
aggagccgcatttccaaatgtccatcacataaaattggagccatctttccggaaaaaaatctaa
aaaggaaatgtcagaatattttccaaatggccaaacgacaatttagttctgtgttgc
aaagtccgaacgaatgaacaaaccaacttgcagagccgttctgaacgagcgaacgaggcc
aggagccctccaaatctggctccactactaggaggaggatgtagaagagactttaagccag
ccccaatgttctcatcgtgtccattctgtcacttgcataatgtacaattctatgatgtct
ttagatgtatgttgcacttgcattttccgtatgttgcataatgtacaattctatgatgtct
ttagatgtatgttgcacttgcattttccgtatgttgcataatgttgcataatgtacaatt
gaggcatgttttagctgtatgttgcataatgttgcataatgttgcataatgtacaatt
gaggcatgttttagctgtatgttgcataatgttgcataatgttgcataatgtacaatt

FIG._32

10082671.051702
MAQACLSLSWADCFAAVIKLPCPLEEVLSNSQFWQYYVLCKDPDWPLAQVTLEAHGWEVGAYC
AFADALYLVLGRLADEFSAYLLFFQLEPGVENVPHIVVQAQATQLSAPNWRRILTQACHDMAIG
FLKPDYLGWAKNCVNIKKDKSGRILRSDWQFVETYLLPKVPLSKVWWYAWINKPEFPIALSAAA
RDRLMRGNALCMQPGPGPSFGDRAEIQGPPIKKTAKSDEFYTLCHWLQEGILTEPAWRQRDLD
GYVRMHTSTQGRQQVVSALAMAKNIIILDSIPNSVFATKAEVVTELCFESNRCVRLLRTQGYDPV
QFGCWVLRWLDRKTGKNTIWFYGVATTGKTNLANAIAHSLPCYGCVNWTNENFPFDAPDKCV
LFWDDEGRVTAKIYESVKVAVLGGQDIRVDQKCKGSSFLRATFVIITSNGDMTVVRDGNTTTFAHR
PAFKDRMVRLNFDVRLPNDFGLITPTEVREWLYRKCEQGDYYEFPDQMYQFPRDVUVSPAPPAL
PQPGPVTAPEEEILDLLTQTNFTQPGGLSIEPAVGPEEEPDVADLGGSPAPAVSSTTESSADE
DEDDDTSSSGDHRGGGGGVMGDLHASSSSFFTSDSGLPTSVENTSDTFSFSPVPVHHGPPTL
LPTSRPTRDLARGRPSFRQYEPLKGRCADSTTFGRPSWAAPCAVNTAELTRRGAGVRVVKGSR
PGAIISGK

FIG._33

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+
atggctcaagcttgcctttctgtcttggcagattgccttgcgcgttcattaaagtggcat
gtccccctcaagagggtgcgtgaccaacaggccatgtttggcaatactatgttctgttaaagatcc
gcgttgcactggccgccttacagtcactgagctgcgtcatgttggagggtgggtgcgtactgt
gcgttgcgtatgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
tgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
ccagttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
tttttgaacactgtactggctggctaaaattgtgttaatattaaaaaagacaagtcgt
gaaatgttttcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
taagggtgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
cgggacaggctgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
accgggcggaaatttcaggggactccataaaaaagactaaaggcatcagatgagtttacactct
cttgtactgtttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
ggctatgttgcgtatgcacacctacttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
ccaaaaacatcatatgttagatcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
agaactctgttggaaatgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
caattttggctgttgggtgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
tttatgggttgcgtactactggaaaactaatcttgcgttgcgttgcgttgcgttgcgttgcgt
ttatgggttgcgtactactggaaaactaatcttgcgttgcgttgcgttgcgttgcgttgcgt
ttgttggggacggggtagagtgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
gccaagacatcagatcagatcagatcagatcagatcagatcagatcagatcagatcagatcagatcag
tataacaagatataggggacatcagatcagatcagatcagatcagatcagatcagatcagatcag
ctgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
ttatcaccccccacttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
ttatgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
cctcagccaggccaggatcacaatgccggagaagaagagatcctgtatccttaccacaa
acttcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
cgcagatcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
gacgaggacgacgacaccccttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
atttcacacgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
caccacgcacaccccttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
ctcccgacactacgcggccacacgcgttgcgttgcgttgcgttgcgttgcgt
cattggaaaggccgggtgtggactgcgtactacgttgcgttgcgttgcgttgcgt
acttcacacacttcggactgcgttgcgttgcgttgcgttgcgttgcgt
ccagggtgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgttgcgt
FIG._34

10082671-051702

MEMFRGVVHVSANFINFVNNDWWCCFYQLEEDDWPRQLQGWERLIAHLIVKVAGEFAVPGGSTLG
LQYFLQAEEHNHFDEGFHVHVVVGGPFVTPRNVCNIVETGFNKVLRELTEPTYEVSFKPAISKKG
KYARDGFDFTVNYLMPKLYPNVVSYTNTFSEYEYVCNSLAYERNNMHKKALNTADEGEGTSTNS
EWGPEPKKQKTGTVRGEKFVSLVDSLIERGIFTENWKQVWDWLKEYACLSGSVAGVHQIKTALT
LAISKNCNSPEYLCELLTRPSTINFNIKENRICKIFLQNQDYPFLYAGKVFIAWLGEGLGRNLTW
LFGPFTTGKTNLAMSLATAVPSYGMVNWNNEPFNFNDVPHKSIILWDEGLIKSTVVEAKAIIIG
GQNCRVDQKNKGSVEVQGTPVLITSNMMDTRVSGNTVTLIHQRALDKRMVEFDLTVRCNSALG
LIPABECKQWLFWSQHTPCDFSRKEVCEFWAKSDRTGICYDFSENEDLPGTQTPLLNSPVT
SKTSALKKTIALATAAVGTIQLTSLTNMWWESSEDGSPPRSSTPLASPERGEVPPGQQWELNT
SVNSVNALNWPMYTVDWVWGSKAQRPVCCLEHDTESSVHCSLCLSLEVPLMLIENSINQPDVIR
CSAHAECTNPFDVLTCKKCRELSALWSFVKYD

FIG._35

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FIG.-36

MEMYRGVIQVNANFTDFANDNWCCFFQLDDVDPRLRGPERLMAHYICKVAALLDTPSGPFLGCKYRFLQVEGNGHDFNGHFIHVV14GPFPLTRNCSAVEGGFNKLVDALFTSPPTIVQFKPAVSKSGVHRYRDGFDFVTYLYMLPKLYPNV1YTSVNLSEYYQVCNSLCSRQPMCPNGSVQEVSVSLYSDGEPEANKKSKVTVRGEKFCSLVDSLIERNIFNENKWKETDFKEYAALSASVAGVHQIKTALTLAVSKCNSPAYLGEILTRPNTINFNRNLIANIFLFSNNYQCPYLAGKMFLLAWQOKLGRNTWLFGLFPSPGTGKNTIAMSASAPVYGMVNWNNEPFNFNDWVPYKS1IILWDEGLIKSTVVEAKASILGGQPCRVDDQKNKGSVEVSQTPVLLTSNSDMTRVVCQGNVTVLVHQRAKLDRMVRFDLTVRCSNALGLIPADEAKQWLWAQNNACDAFTQWHLSSDHVAWVKDRTTLCHDFQSEPEPDSELPSSGESVFSDRSDLSTSFLWDVQDQSSPENSEDVWEDIAADLSEHWWIDDLQEDS3CSPRCPSTPVAAEPEVPTGTGGGLKWEKNNVSYHVDTELNRWPMPFSDVWUWGTNVRKPVCCLLEHDKEFGVHCSLCLSLEVPLMIEKTSILVPPDTLRCSAHGDCTNPFDV1TJCKKCRDLSGLMSPELHE

FIG. 37

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FIG.-38

MDMFRGVQIQLTANITDFANDSWWCSFLQLDSDDWPRLRGVERLVAIFICKVAAVLNDNPGSTSGL
CKYFLQAEGRGHYDAGFHVHIVPFIARNCVNAEVTTFNKLVLGDLDTPMSVSVQFKPAVSKSG
EYRYDGFDFVTNYMLPKLYPNVIVSNTLEEYQVCSNLCSRKNMHKQHMVSFTDVADSSSFMND
MYPEATRKSCTVKGEKFRNLVDSLIERNIFSESKWKEVDFNPFARLSASVAGVHQIKTAITL
AVSKCNSPDYLFLQIILTRPSTIHFNKIQLNNNCCPLYAGEVFVLWIKQGKRNTQS
YGPPTGKTNVAMSLASAVPTYGMVNWNNEPNFPFDVWYPSKSLILWDLEGLIKSTVVEAKAISLGG
QPCRVRDQKMGWSVEVTGTPVLLTTSNSDMTRVWVYTVLVLHQRAKDRMVRFDLTVRCSNALGLI
PADEAKQWLWWAQSCPQCDFTQWHSQVSEHAWVANKADRTGLHFDFSTKPEQESENAKSNGKSNSDFA
GSDLANLSSLWDVETDSSSESQDIAELVLSNDNWLQSGCPFTCRSTPVTEVPEKQVSPGTGG
GLTKWNLKNSVHQNRELAWPMFSDVLTCKWCRDLJGLMSPLEHDO
KISINVPDTLRCSAHGDCTNPFDVLTCKWCRDLJGLMSPLEHDO

FIG. 39

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FIG.-40

MELFRGVQLQVSSNVLDANDNWCSLLDLDTSDEWPLHTNRLMAIYLSSVASKLDFTGGPLAG
CLYFQVCECNKFEVGLHYHVVICGPGPRNLTIVCWNFLVNLVYHLLTENVKLFLPGRM
KYFRDGEQFIEYNLMLK1PNLVNCVNTNDY1DTCTISATFRRGACHAKKPRITTAINDTSSDA
GESSGTAEVVPINGKGTAKASIKFQTMVNWLCENRVFTEDKWKLVDNFQYTLLSSSHSGSFQIQC
SALKLAIYKATNLVPTSTFLLHDTEQVCMICDKNVLK1VLLKLCDNYDPLLVQGHVLLKWDIKRCG
KNTLWFGPSTGKTLAMAIAKSUPVYVGWMVNWNENPFNDVAGSKLUVVDEGIKSTIVEAA
KAILLGGQFTRVDQCKMRGSVAVPGPVVITSNGDITFVVSQNTTTTVHAKALKERMVKLNFRTVRC
SPDMGLLTDADTVQWQTLWCNAQSWDHYENWAINTYTFDPFGINADALHPDLQTTPITVTDTSISS
GGESSEELSESSFFNLTTPGAWNNTETPRSSTPITPGTSSGESFVGSSVSSEVAASWEAFTYPL
ADQFWRFLVVGVDWVGDCKVRGLFPCVCCQHINNSGGGLGLCPHCINVGAWYNGWKFRFETPDLVRC
SCHVGASNEFVSDVSLTCVKRGLYIQLSLOFSVYDNE

FIG.-41

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+
atggagctatTTtagagggtgcttcaagtttcttaatgttctggactgtgctaacgataact
ggtgtgtctttactggatttagacacttgcactggaaaccactaactcataaacagact
aatggcaatatacttaaagcagtgtggcttcaagcttgcactttaccggggccactagcggg
tgcttgcactttcaagttagaaatgtaaacaaatTTgaagaaggcttatcatattcatgtggta
ttggggccagggttAAACCCcgaaacactcacaagtgtgttaggggttatttaataatgt
actttatcacctgttaactgtaaaatgtaaacgtttttcaggaaatgtactacaaaaggc
aaatacttttagagatggagcagttatagaaaactatTTaatgaaaaaaataccttaaatg
ttgtatgtgtttactaatatgtgatataatgatcacctgttattttgtactttttgaag
ggggaggcttcatggcaagaacccccccatattaccacaggccataatgacacttagttagtgc
ggggaggcttagcggcacaggggcagagggtgtgccaattaatgggaagggaactaaggctagca
taaagtttcaactatgttaactgtgtgtgtggaaaacagactgtttacagaggataatgtggaa
acttagtgcattttacccatgcactttactaagcagtagtgcacatgtggaaattttcaatttca
atgtgcactaaaacttagcaatttataaagcactaatttagtgcatacagcacatttttattgc
atacagacttttgcagggttatgttataaagcataatTTatgttgcatacagcacatttttattgc
aaactatgcaccccttattgtggggcagcatgtgttgcattttatgtgataaaaaaatgtggcaag
aaaatacactgtgtttatggccgcacaggtaacagaaaaacaaacttgcacatggccatttgc
ctaaaatgttgcattatgttgcattttatgttgcataatgtggaaaacttccatattgtgt
agcaggggaaaactgtgtgtctggatgggttattttatgttgcataattgttgcataatgtgt
aaagccatTTtagggccacccaccagggttagataaaaatgcgtggaaatgttagtgc
ctggtagtacccatgtgttgcataaccgcacatgttgcattttatgttgcataatgtgt
acaactgttgcacatgttgcataaagcattttatgttgcataatgttgcataatgtgt
agccctgcacatgggttactaacagaggctgtatgcataacacatgttgcattatgttgc
aaagtggggaccactatgttgcataatgttgcataatgttgcattttatgttgcataatgttgc
agatgccttcaccccgacccatgttgcataacatgttgcataatgttgcataatgttgc
gttgcataatgttgcataatgttgcataatgttgcataatgttgcataatgttgc
ggaaactgttgcacccatcccgcgttagtgcacccatcccggggcaggcttgcataatgttgc
cggaactgttgcacccatcccgcgttagtgcacccatcccggggcaggcttgcataatgttgc
cgagaccatgttgcacccatcccgcgttagtgcacccatcccggggcaggcttgcataatgttgc
ctgtgtgtgtgtgcacatattaaacatgttgcacccatcccggggcaggcttgcataatgttgc
taatgttaggggttgcataatgttgcacccatcccggggcaggcttgcataatgttgc
agctgcacatgttgcacccatcccggggcaggcttgcataatgttgcacccatcccggggcaggcttgc
ctggattgcacatgttgcacccatcccggggcaggcttgcataatgttgcacccatcccggggcaggcttgc

FIG._42

20 / 30 - 1 / 928001
MELFRGVILQVSSNVLDCAANDNWCSLLDLTSIWEPPLHTNRLMAIYLSSVASKLDFTGGPLAG
CLYFFQVECNKFEEGYHIVVIGGPGLNPRNLTMCEGLFMNVLYHLVTENVKLKFPLPGMTTKG
KYFRDGEQFIENYLIKKIPLNWWVVCVTNIQGYIDTCISATFRRGACHAKPRITTAINDTSSDA
GESSGTGAEVVVPFNGKGTKASIKFQTMVNWLCENRVFTEDWKLVDFNQYTLLSSSHSGSFQIQ
SALKLAIYKATNLVPTSTFLHTDFEQVMC1KDNKIVKLLLCQNYDPLLVGQHVWKWDIDKKCGK
KNTLWVFYGPPTGCKTNLAMAIAKSVBVYGMVNWNENFPFDNDVAGKSILVWDEGIKSTTIVEAA
KAILGGQPTRDVKMRGSVAAPGVPVITTSNGDITFVVSGNTTTTVHAKALKERMVKLNFTVRC
SPDMGLLTEADVQWQLTWCAQSWDHENWAINYTFDFPGINADALHPDLQTTPIVTDTSISS
GESSSEELSESSFLNLITPGAWNTTPRSSTPIPGETSGGESFVGSPVSSEVVAASWEAFYTPFL
ADQFRELLVGVDYVWWDGVVRGLPVCVQHINNSGGGLGLCPHCINVGAWYNGWKFREFTPDLVRC
SCHVGASNPFSVLTCKKAYLSQLQSFDYE

FIG._43

FIG.-44

MFSIINPSDDFWTKDKYIMLTIGPVEWEAIEPGISTDFCKFSNVPVPHFRDMHSPGAPDIKW
ITACTKMDVILWNYWNKKNTAVPTFAKWWYQAENKGRSLSTLADGPTATIGKHTTEIRGV
LKIDFFDGNAPKIDDDWCTYATAKTRNKGGTQVFSLSYIFALLQIIRPQFWAWTNINELGJVD
EIERKRHISLHSFNKKPNVKLMLFPKDGTNRLSLSKSKFLGTIEWLSDLGIVTEDAWIRRDVRSYM
LLTLTHGDVLIRHALSISKRRAIRTRAKDPIAHIDTDFEYLIEYENPVYQLFCQLSQFDPLAGTIL
YQWLSHRGKKNVTFSFIGPPCGKSMLTGAILENIPHLGIGHLSMTKLNRJAYQVOLVWLWWDI
SINENPDKLSSLLGGKKLIFPENENDHQVQIGCPDLSKCFDTCVDIRSMVHSNIHKINLSQLRVYNF
TFDKVKIPRNFPVIOKHDINOFLEWARNRSNCISFCIDYTVPKIL

FIG.-45

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atgtttccataataatccaagtgtatggactaaggacaatatacatgttgacta
tcaaaggccccgtggagtggaggcagaaatccctggaatatctacggattttttgcatt
ctctaaatcgccgtccacatggtagatgtcactaccggggcggccggatattaaatgg
ataactcgatgtaccaaaatgtcactatcaatctactggagaataaaaactggcgtcc
ccacccctgcacaaatggtaatgtcactaccggggatggaaacacacaaacggaaatcagggtgt
gatagcttagatggaaatcccaccgcacatggaaaacacacaaacggaaatcagggtgt
ttaatataagatgttcgcacgggaccccttaatataatggatgttgcacgtatgcacaaa
caaagaaaaatggggcgaacccagggttcgtctaagtatatacccttgccttcattca
attttagaccacagtccatggcatggcaaatattaacggactggagacgtatgcgt
gaaatacatgcacaaacatcatccatttcataatggcaaaaacactatgtttaaacttatgt
ttccaaaggatgggaccaacagaatatctttaaatctaaatttctggaaacctcgatggct
gtctgtatgttgcataatgtcactggggatggatcggaaactggatcataatcgacaa
ttatgtacactaacacacggggatggatcattatcatgggtctatctatataatctaaagaa
taagagcaacttagaaaagctatcgatttatagcgcacatagacactgtactttgaatctatga
aaacccgggttaccagggttgcgtctgtcgtttgaccctatattacggaaaccatattat
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gtggaaaatcgatgttaacccggggcattttggaaatatccctggatcgtggaaatattacacgg
atctttgaatactaaaatattaaatggatcggacagggtttagtcttgcgtggaaagacata
agttatcacttt
caattaaatgaaaacggaccacgtacatggacggccgttccatcatagccacatctgggt
tatacgctcgatgttacattaaatccacaaaatctatcatacggatataatattcc
acatgtttataatgtttatccctgcacatggatcggatcggatataatcaatttc
tgttctggccagaaaccgttctataatgttttattgtactacacgggttccaaaattttataaa

FIG._46

5'-ttggccactccctctcgcgctcgctcactgaggccggcgaccaaaggtegcc-3'

FIG._47

5'-ggcggttgggctcgcgctcgctcgatggcgccgg-3'

FIG._48

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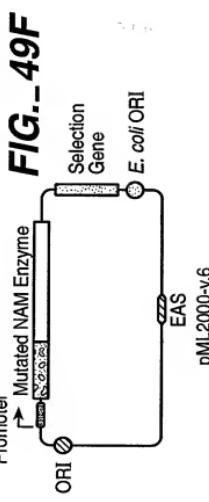
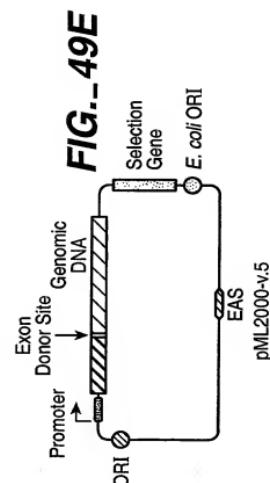
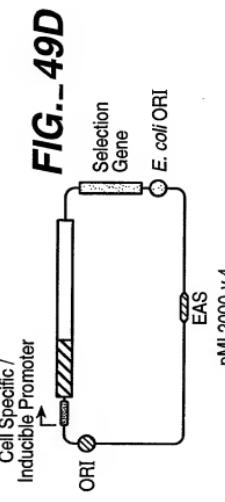
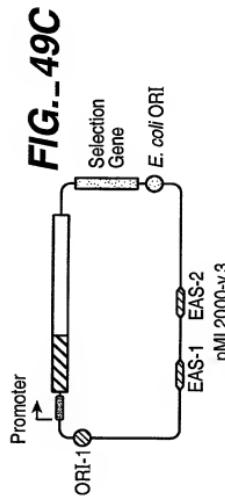
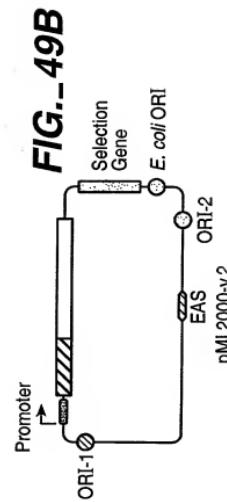
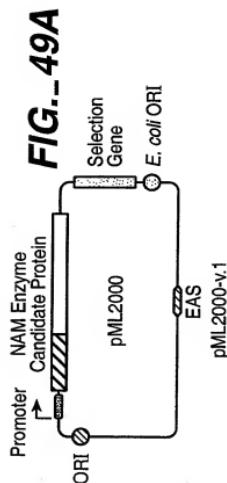
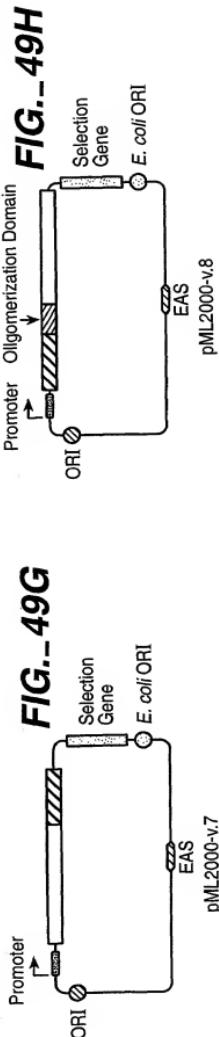
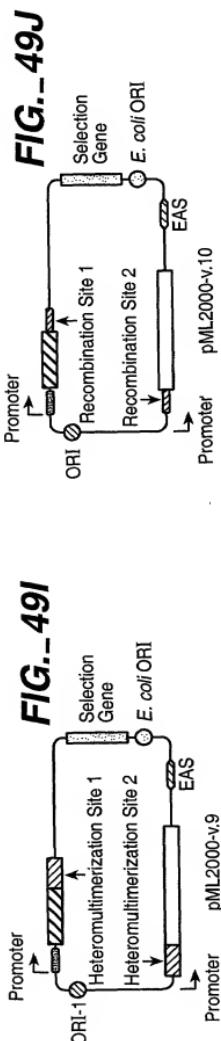
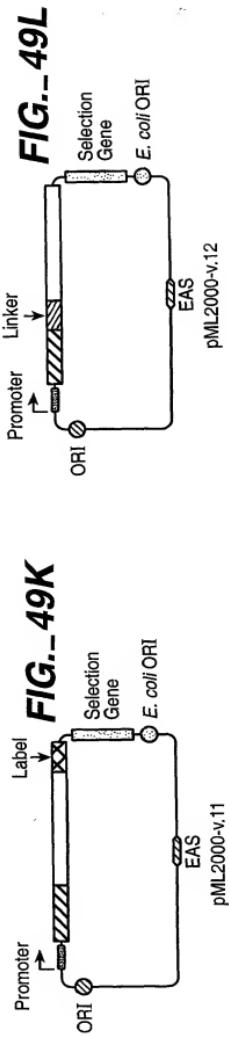
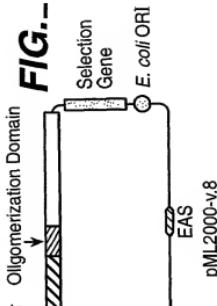
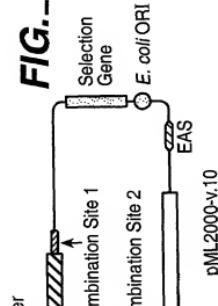
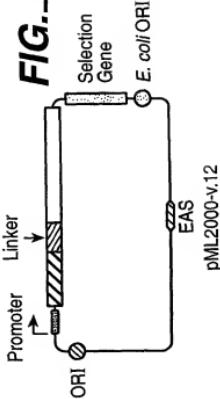
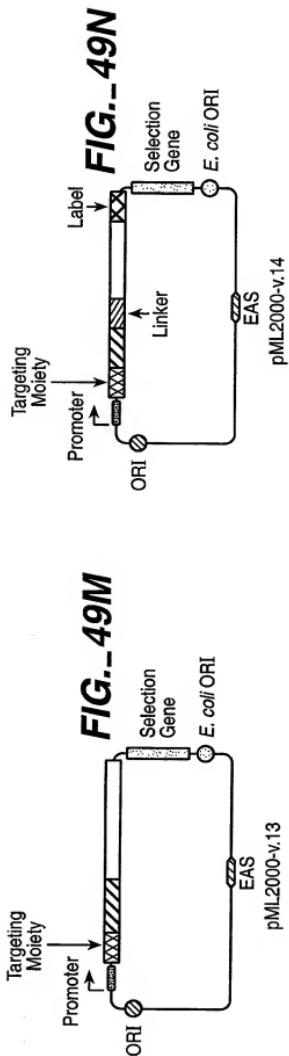


FIG.-49G**FIG.-49I****FIG.-49K****FIG.-49H****FIG.-49J****FIG.-49L**



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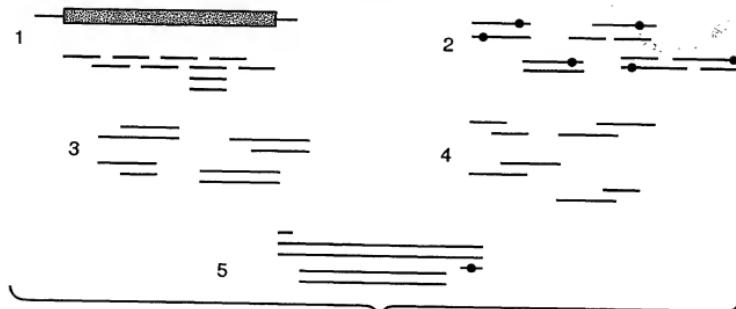


FIG.-50

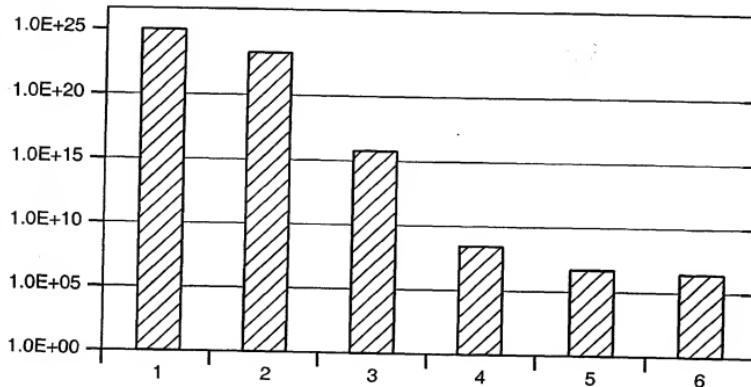


FIG._51

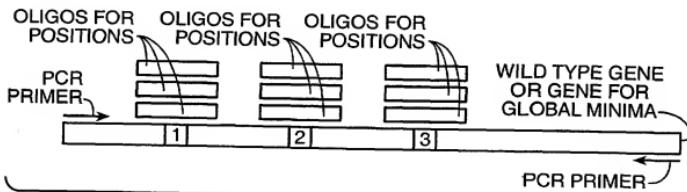
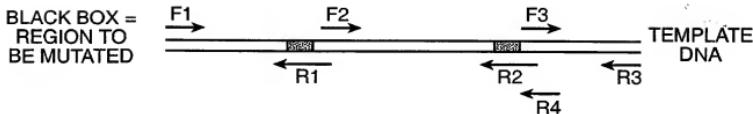


FIG.-52

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STEP 1: SET UP 3 PCR REACTIONS:

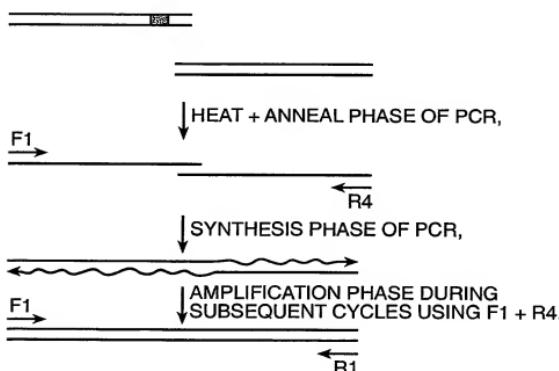
PRODUCTS:

TUBE 1:

TUBE 2:

TUBE 3:

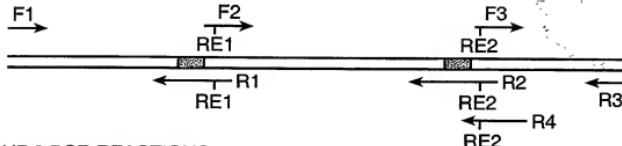
STEP 2: SET UP PCR REACTION WITH PRODUCTS OF TUBE 1 +
PRODUCTS TUBE 2 + F1 + R4.



STEP 3: REPEAT STEP 2 USING PRODUCT FROM STEP 2 + PRODUCT
FROM STEP 1, TUBE 3 + PRIMERS F1 + R3.

FIG.-53

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STEP 1: SET UP 3 PCR REACTIONS:

TUBE 1: RE1

TUBE 2: RE1 RE2

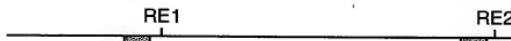
TUBE 3: RE2

STEP 2: DIGEST PRODUCTS FROM STEP 1 WITH SUITABLE RESTRICTION ENDONUCLEASES.

STEP 3: LIGATE DIGESTED PRODUCT FROM STEP 2, TUBE 2 WITH DIGESTED PRODUCT FROM STEP 2, TUBE 1.



STEP 4: AMPLIFY VIA PCR LIGATED PRODUCTS OF STEP 3 WITH F1 + R4.



STEP 5: DIGEST AMPLIFIED PRODUCT OF STEP 4 WITH RESTRICTION ENDONUCLEASE #2.



STEP 6: LIGATE PRODUCT FROM STEP 5 WITH PRODUCT FROM STEP 2, TUBE 1.



STEP 7: AMPLIFY PRODUCT FROM STEP 6 WITH F1 + R3.

FIG._54

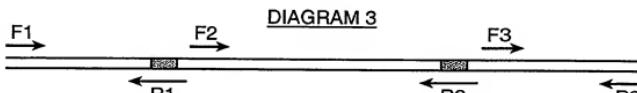


FIG._55

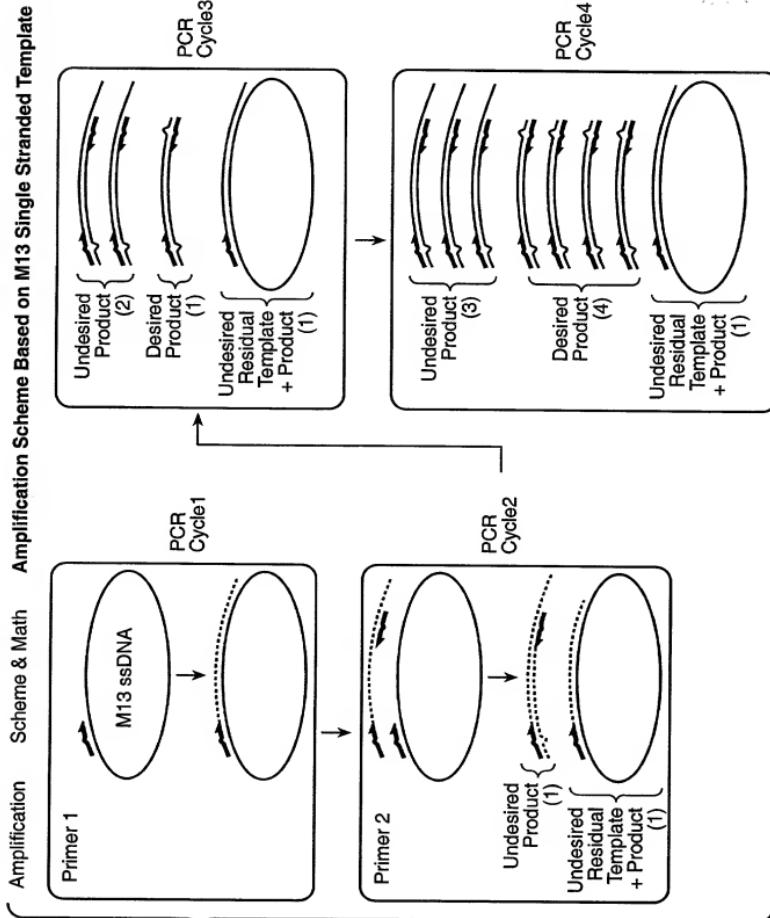


FIG._56B

Amplification Scheme Based on M13 Single Stranded Template

Numerical Progression of Desired Product with Increasing PCR Cycles

PCR Cycles	Desired Product	Undesired Products and Residual Template	Percent Desired Product in Total Product
1		1	
2	0	2	0.00%
3	1	3	25.00%
4	4	4	50.00%
5	11	5	68.75%
6	26	6	81.25%
7	57	7	89.06%
8	120	8	93.75%
9	247	9	96.48%
10	502	10	98.05%
11	1013	11	98.93%
12	2036	12	99.41%
13	4083	13	99.68%
14	8178	14	99.83%
15	16369	15	99.91%
16	32752	16	99.95%
17	65519	17	99.97%
18	131054	18	99.99%
19	262125	19	99.99%
20	524260	20	100.00%

